

Linking Study Report: Predicting Performance on the Michigan State Assessment System in Grades 3–8 ELA and Mathematics based on NWEA MAP Growth Scores

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NWEA Psychometric Solutions



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Executive Summary

To predict student achievement on the Michigan state assessment system in Grades 3–8 for English Language Arts (ELA) and Mathematics, NWEA® conducted a linking study using Spring 2019 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the Michigan performance levels. The Michigan state assessment system includes the Michigan Student Test of Educational Progress (M-STEP) in Grades 3–7 and the PSAT™ 8/9 in Grade 8. With this information, educators can identify students at risk of failing to meet state proficiency standards early in the year and provide tailored educational interventions. The linking study has been updated since the previous version published in December 2016 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020) and generate MAP Growth cut scores for the Grade 8 PSAT 8/9 assessment that replaced the M-STEP for Grade 8 students beginning in Spring 2019.

Table E.1 presents the Michigan *Proficient* performance level cut scores and the corresponding MAP Growth RIT cut scores that allow teachers to identify students who are on track for proficiency on the state summative test and those who are not. For example, the *Proficient* cut score on the M-STEP Grade 3 ELA test is 1300. A Grade 3 student with a MAP Growth Reading RIT score of 193 in the fall is likely to meet proficiency on the M-STEP ELA test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 193 in the fall is in jeopardy of not meeting proficiency. MAP Growth cut scores for Grade 2 are also provided so educators can track early learners’ progress toward proficiency on the M-STEP test by Grade 3. These cut scores were derived based on the Grade 3 cuts and the 2020 NWEA growth norms for the adjacent grade (e.g., Grades 2 to 3).

Table E.1. MAP Growth Cut Scores for Proficiency on Michigan’s State Assessments

Assessment		Proficient Cut Scores						
		2	3	4	5	6	7	8
ELA/Reading								
M-STEP/PSAT	Spring	–	1300	1400	1500	1600	1700	390
MAP Growth	Fall	181	193	201	208	215	219	221
	Winter	189	200	207	212	219	222	223
	Spring	193	203	209	214	220	223	224
Mathematics								
M-STEP/PSAT	Spring	–	1300	1400	1500	1600	1700	430
MAP Growth	Fall	179	192	204	217	221	226	229
	Winter	188	199	211	223	226	230	232
	Spring	193	204	215	227	229	233	234

Please note that the results in this report may differ from those found in the NWEA reporting system for individual districts. The typical growth scores from fall to spring or winter to spring used in this report are based on the default instructional weeks most encountered for each term (i.e., Weeks 4, 20, and 32 for fall, winter, and spring, respectively). However, instructional weeks often vary by district, so the cut scores in this report may differ slightly from the MAP Growth score reports that reflect the specific instructional weeks set by partners.

E.1. Assessment Overview

The M-STEP assessments are administered to students in Grades 3–7 to measure their knowledge of Michigan’s academic standards in ELA and mathematics. The PSAT 8/9 measures performance in ELA and mathematics in Grade 8. Based on their test scores on either the M-STEP or PSAT, students are placed into one of four performance levels: *Not Proficient*, *Partially Proficient*, *Proficient*, and *Advanced*. These tests are used to provide evidence of student achievement in ELA and mathematics for various test score uses such as meeting the requirements of the state’s accountability system. The *Proficient* cut score demarks the minimum level of achievement considered to be proficient. MAP Growth tests are adaptive interim assessments aligned to state-specific content standards and administered in the fall, winter, and spring. Scores are reported on the RIT vertical scale with a range of 100–350.

E.2. Linking Methods

Based on scores from the Spring 2019 test administration, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring Michigan performance level cut scores. Spring cuts for Grade 2 were derived based on the cuts for Grade 3 and the 2020 NWEA growth norms. MAP Growth fall and winter cut scores that predict proficiency on the spring state assessment were then projected using the 2020 NWEA growth norms that provide expected score gains across test administrations.

E.3. Student Sample

Only students who took both the MAP Growth and Michigan state assessments in Spring 2019 were included in the study sample. Table E.2 presents the weighted number of Michigan students from 37 districts and 153 schools who were included in the linking study. The linking study sample is voluntary and can only include student scores from partners who share their data. Also, not all students in a state take MAP Growth. The sample may therefore not represent the general student population as well as it should. To ensure that the linking study sample represents the state student population in terms of race, sex, and performance level, weighting (i.e., a statistical method that matches the distributions of the variables of interest to those of the target population) was applied to the sample. As a result, the RIT cuts derived from the study sample can be generalized to any student from the target population. All analyses in this study for Grades 3–8 were conducted based on the weighted sample.

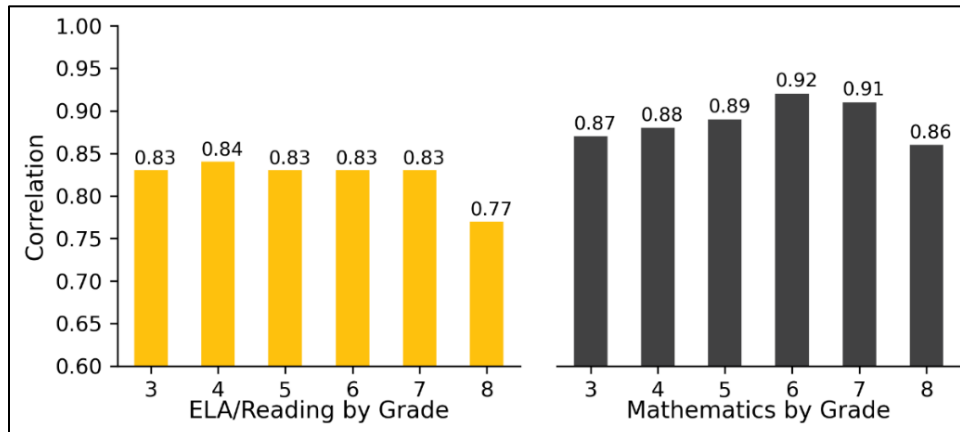
Table E.2. Linking Study Sample

Grade	#Students	
	ELA/Reading	Mathematics
3	7,503	7,529
4	7,636	7,702
5	7,652	7,633
6	8,030	8,056
7	6,860	6,903
8	5,733	5,483

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and Michigan’s state assessment scores range from 0.77 to 0.92 across both content areas, as shown in Figure E.1. Overall, these values indicate a strong relationship among the scores, which is important validity evidence for the claim that MAP Growth scores are good predictors of performance on Michigan’s state assessments. The value for Grade 8 in ELA/reading is lower than average, which is likely due to the construct differences measured by the PSAT ELA assessment (reading and writing) and MAP Growth Reading.

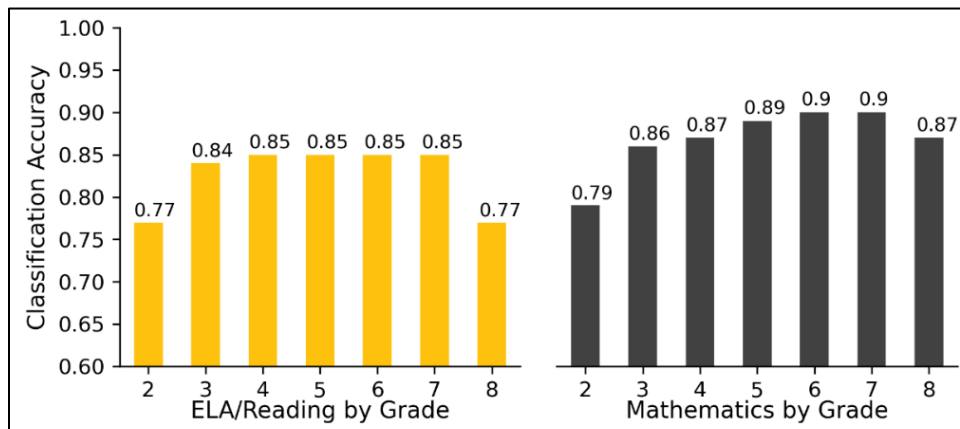
Figure E.1. Test Score Correlations between MAP Growth and Michigan’s State Assessments



E.5. Accuracy of MAP Growth Classifications

Figure E.2 presents the classification accuracy statistics that show the proportion of students correctly classified by their RIT scores as proficient or not proficient on Michigan’s state assessments. For example, the MAP Growth Reading Grade 3 *Proficient* cut score has a 0.84 accuracy rate, meaning it accurately classified student achievement on the state test for 84% of the sample. The results range from 0.77 to 0.90 across both content areas. Overall, these values indicate that RIT scores have a high accuracy rate of identifying student proficiency on Michigan’s state assessments. Once again, the value for Grade 8 in ELA/reading is lower than average due to the construct differences in the PSAT ELA assessment and MAP Growth Reading. The Grade 2 classification accuracy rate refers to how well the MAP Growth cuts can predict students’ proficiency status on the state test in Grade 3. Consequently, the further back from Grade 3 the cut scores were extrapolated, the lower the expected classification accuracy rate.

Figure E.2. Accuracy of MAP Growth Classifications



1. Introduction

1.1. Purpose of the Study

NWEA® is committed to providing partners with useful tools to help make inferences about student learning from MAP® Growth™ test scores. One important use of MAP Growth results is to predict a student's performance on the state summative assessment at different times throughout the year. This allows educators and parents to determine if a student is on track in their learning to meet state standards by the end of the year or, given a student's learning profile, is on track to obtain rigorous, realistic growth in their content knowledge and skills.

This document presents results from a linking study conducted by NWEA in December 2020 to statistically connect the scores of the Michigan state assessment system in Grades 3–8 for English Language Arts (ELA) and Mathematics with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2019 term. The Michigan state assessment system includes the Michigan Student Test of Educational Progress (M-STEP) in Grades 3–7 and the PSAT™ 8/9 in Grade 8. The linking study has been updated since the previous version published in December 2016 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020). In this updated study, MAP Growth cut scores are also included for Grade 2 so educators can track early learners' progress toward proficiency on the M-STEP test by Grade 3. This report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth cut scores that correspond to the state performance levels using equipercentile linking for the spring results and the 2020 norms for fall and winter
4. MAP Growth cut score that corresponds to Michigan's Read by Grade 3 (RBG3) program
5. Classification accuracy statistics to determine the degree to which MAP Growth accurately predicts student proficiency status on Michigan's state assessments
6. The probability of achieving grade-level proficiency on the Michigan state assessments based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The M-STEP assessments are administered to students in Grades 3–7 to measure their knowledge of Michigan's academic standards in ELA and mathematics. The PSAT 8/9 measures performance in ELA and mathematics in Grade 8. Each assessment has three cut scores (i.e., the minimum score a student must get on a test to be placed in a certain performance level) that distinguish between the following performance levels: *Not Proficient*, *Partially Proficient*, *Proficient*, and *Advanced*. The *Proficient* cut score demarks the minimum level of performance considered to be proficient for accountability purposes.

MAP Growth interim assessments from NWEA are computer adaptive and aligned to state-specific content standards. Scores are reported on the RIT vertical scale with a range of 100–350. Each content area has its own scale. To aid the interpretation of scores, NWEA periodically conducts norming studies of student and school performance on MAP Growth. Achievement status norms show how well a student performed on the MAP Growth test compared to students in the norming group by associating the student's performance on the MAP Growth test, expressed as a RIT score, with a percentile ranking. Growth norms provide expected score gains across test administrations (e.g., the relative evaluation of a student's growth from fall to spring). The most recent norms study was conducted in 2020 (Thum & Kuhfeld, 2020).

2. Methods

2.1. Data Collection

This linking study is based on data from the Spring 2019 administrations of the MAP Growth and Michigan's state assessments in Grades 3–8. NWEA recruited Michigan districts to participate by sharing their student and score data for the target term. Districts also gave NWEA permission to access students' associated MAP Growth scores from the NWEA in-house database. Once state score information was received by NWEA, each student's state testing record was matched to their MAP Growth score by using the student's first and last names, date of birth, student ID, and other available identifying information. Only students who took both the MAP Growth and Michigan state assessments in Spring 2019 were included in the sample.

2.2. Post-Stratification Weighting

Post-stratification weights were applied to the calculations to ensure that the linking study sample represented the state population in terms of race, sex, and performance level. These variables were selected because they are correlated with the student's academic achievement within this study and are often provided in the data for the state population. The weighted sample matches the target population as closely as possible on the key demographics and test score characteristics. Specifically, a raking procedure was used to calculate the post-stratification weights and improve the representativeness of the sample. Raking uses iterative procedures to obtain weights that match sample marginal distributions to known population margins. The following steps were taken during this process:

- Calculate marginal distributions of race, sex, and performance level for the sample and population.
- Calculate post-stratification weights with the rake function from the survey package in R (Lumley, 2019).
- Trim the weight if it is not in the range of 0.3 to 3.0.
- Apply the weights to the sample before conducting the linking study analyses.

2.3. MAP Growth Cut Scores

The equipercntile linking method (Kolen & Brennan, 2004) was used to identify the spring MAP Growth RIT scores that correspond to the spring Michigan performance level cut scores. Spring cuts for Grade 2 were derived based on the cuts for Grade 3 and the 2020 NWEA growth norms. RIT fall and winter cut scores that predict proficiency on the spring state assessment were then projected using the 2020 growth norms. Percentile ranks are also provided that show how a nationally representative sample of students in the same grade scored on MAP Growth for each administration, which is an important interpretation of RIT scores. This is useful for understanding (1) how student scores compared to peers nationwide and (2) the relative rigor of a state's performance level designations for its summative assessment.

The MAP Growth spring cut scores for Grades 3–8 could be calculated using the equipercntile linking method because that data are directly connected to the Michigan spring test data used in the study. The equipercntile linking procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of tests at or below each score). For example, let x represent a score on Test X (e.g., M-STEP). Its equipercntile equivalent score on Test Y (e.g., MAP Growth), $e_y(x)$, can be obtained through a cumulative-distribution-based linking function defined in Equation 1:

$$e_y(x) = G^{-1}[P(x)] \quad (1)$$

where $e_y(x)$ is the equipercentile equivalent of score x on M-STEP on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on M-STEP, and G^{-1} is the inverse of the percentile rank function for MAP Growth that indicates the score on MAP Growth corresponding to a given percentile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the score distributions and equipercentile linking curve.

The MAP Growth conditional growth norms provide students' expected score gains across terms, such as growth from fall or winter to spring within the same grade or from spring of a lower grade to the spring of the adjacent higher grade. This information can be used to calculate the fall and winter cut scores for Grades 3–8 and the fall, winter, and spring cut scores for Grade 2. Equation 2 was used to determine the previous term's or grade's MAP Growth score needed to reach the spring cut score, considering the expected growth associated with the previous RIT score:

$$RIT_{PredSpring} = RIT_{previous} + g \quad (2)$$

where:

- $RIT_{PredSpring}$ is the predicted MAP Growth spring score.
- $RIT_{previous}$ is the previous term's or grade's RIT score.
- g is the expected growth from the previous RIT (e.g., fall or winter) to the spring RIT.

To derive the spring cut scores for Grade 2, the growth score from spring of one year to the next was used (i.e., the growth score from spring Grade 2 to spring Grade 3). The calculation of fall and winter cuts for Grade 2 followed the same process as the other grades. For example, the growth score from fall to spring in Grade 2 was used to calculate the fall cuts for Grade 2.

2.4. Classification Accuracy

The degree to which MAP Growth predicts student proficiency status on the Michigan state assessments can be described using classification accuracy statistics based on the MAP Growth spring RIT cut scores that show the proportion of students correctly classified by their RIT scores as proficient or not proficient. Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich et al., 2004). The results are based on the Spring 2019 MAP Growth and Michigan state test data for the *Proficient* cut score.

Since Michigan students do not begin taking the statewide assessment until Grade 3, longitudinal data were collected for the Grade 3 cohort in order to link the M-STEP assessment to MAP Growth for Grade 2 to calculate the classification accuracy statistics. To accomplish this, 2018–2019 M-STEP Grade 3 results were linked to MAP Growth data from Grade 3 students in 2018–2019 and Grade 2 students in 2017–2018. In this way, the data came from the same cohort of students beginning when they were in Grade 2 and continuing through Grade 3.

Table 2.1. Description of Classification Accuracy Summary Statistics

Statistic	Description*	Interpretation
Overall Classification Accuracy Rate	$(TP + TN) / (\text{total sample size})$	Proportion of the study sample whose proficiency classification on the state test was correctly predicted by MAP Growth cut scores
False Negative (FN) Rate	$FN / (FN + TP)$	Proportion of not-proficient students identified by MAP Growth in those observed as proficient on the state test
False Positive (FP) Rate	$FP / (FP + TN)$	Proportion of proficient students identified by MAP Growth in those observed as not proficient on the state test
Sensitivity	$TP / (TP + FN)$	Proportion of proficient students identified by MAP Growth in those observed as such on the state test
Specificity	$TN / (TN + FP)$	Proportion of not-proficient students identified by MAP Growth in those observed as such on the state test
Precision	$TP / (TP + FP)$	Proportion of observed proficient students on the state test in those identified as such by the MAP Growth test
Area Under the Curve (AUC)	Area under the receiver operating characteristics (ROC) curve	How well MAP Growth cut scores separate the study sample into proficiency categories that match those from the state test cut scores. An AUC at or above 0.80 is considered “good” accuracy.

*FP = false positives. FN = false negatives. TP = true positives. TN = true negatives.

2.5. Proficiency Projection

In addition to calculating the MAP Growth fall and winter cut scores, the MAP Growth conditional growth norms data were also used to calculate the probability of reaching proficiency on the Michigan state assessment based on a student’s RIT scores from fall, winter, and spring. Equation 3 was used to calculate the probability of a student achieving *Proficient* on the Michigan state test based on their fall or winter RIT score:

$$Pr(\text{Achieving Proficient in spring} | \text{starting RIT}) = \Phi \left(\frac{RIT_{previous} + g - RIT_{SpringCut}}{SD} \right) \quad (3)$$

where:

- Φ is a standardized normal cumulative distribution.
- $RIT_{previous}$ is the student’s RIT score in fall or winter (or in spring of Grade 2).
- g is the expected growth from the previous RIT (e.g., fall or winter) to the spring RIT.
- $RIT_{SpringCut}$ is the MAP Growth *Proficient* cut score for spring. For Grade 2, this is the Grade 3 cut score for spring.
- SD is the conditional standard deviation of the expected growth, g .

Equation 4 was used to estimate the probability of a student achieving *Proficient* on the Michigan state test based on their spring RIT score (RIT_{Spring}):

$$Pr(\text{Achieving Proficient in spring} | \text{spring RIT}) = \Phi \left(\frac{RIT_{Spring} - RIT_{SpringCut}}{SE} \right) \quad (4)$$

where SE is the standard error of measurement for MAP Growth.

3. Results

3.1. Study Sample

Only students who took both the MAP Growth and Michigan state assessments in Spring 2019 were included in the study sample. Data used in this study were collected from 37 districts and 153 schools in Michigan. Table 3.1 presents the demographic distributions of race, sex, and performance level in the original unweighted study sample. Table 3.2 presents the distributions of the student population that took the Spring 2019 Michigan state tests in Grades 3–8. Since the unweighted data are different from the general Michigan student population, post-stratification weights were applied to the linking study sample to improve its representativeness. Table 3.3 presents the demographic distributions of the sample after weighting, which are almost identical to the Michigan student population distributions. The analyses in this study were therefore conducted based on the weighted sample.

Table 3.1. Linking Study Sample Demographics (Unweighted)

Linking Study Sample (Unweighted)							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
ELA/Reading							
Total N		7,503	7,636	7,653	8,031	6,860	5,733
Race*	AI/AN	0.3	0.4	0.4	0.3	0.4	0.5
	Asian	2.8	2.7	2.5	2.7	2.1	2.5
	Black	13.3	13.5	11.6	12.7	14.4	14.1
	Hispanic	5.1	5.3	5.1	5.3	5.7	5.6
	Multi-race	4.0	3.5	4.0	3.3	3.5	3.5
	NH/PI	0.1	0.2	0.1	0.2	0.2	0.1
	White	74.3	74.4	76.3	75.4	73.6	73.8
Sex	Female	50.2	49.6	50.3	49.8	49.0	49.4
	Male	49.8	50.4	49.7	50.2	51.0	50.6
Performance Level	<i>Not Proficient</i>	27.8	31.7	29.8	29.5	31.0	20.5
	<i>Partially Proficient</i>	25.4	20.9	21.3	26.2	27.5	14.3
	<i>Proficient</i>	23.8	23.0	29.9	29.4	30.3	22.8
	<i>Advanced</i>	23.0	24.4	19.0	14.8	11.3	42.4
Mathematics							
Total N		7,528	7,702	7,633	8,057	6,903	5,483
Race*	AI/AN	0.3	0.4	0.4	0.3	0.4	0.4
	Asian	2.8	2.7	2.6	2.7	2.1	2.5
	Black	13.2	13.3	11.6	12.6	14.6	13.8
	Hispanic	5.1	5.3	5.1	5.4	5.7	5.7
	Multi-race	4.0	3.6	3.9	3.3	3.6	3.6
	NH/PI	0.1	0.2	0.1	0.2	0.2	0.1
	White	74.3	74.4	76.3	75.4	73.4	73.8
Sex	Female	50.2	49.6	50.3	49.9	49.3	49.5
	Male	49.8	50.4	49.7	50.1	50.7	50.5

Linking Study Sample (Unweighted)							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
Performance Level	<i>Not Proficient</i>	24.1	22.2	31.8	30.6	34.8	23.3
	<i>Partially Proficient</i>	26.2	34.9	30.4	31.3	30.5	34.6
	<i>Proficient</i>	29.7	26.4	19.9	20.8	19.7	27.5
	<i>Advanced</i>	20.0	16.5	17.8	17.4	15.0	14.6

*AI/AN = American Indian/Alaskan Native. NH/PI = Native Hawaiian/Pacific Islander.

Table 3.2. Spring 2019 Michigan Student Population Demographics

Spring 2019 Michigan Student Population							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
ELA							
Total N		100,793	102,327	105,078	108,948	108,975	107,518
Race*	AI/AN	0.5	0.6	0.6	0.7	0.6	0.7
	Asian	3.5	3.4	3.3	3.3	3.4	3.5
	Black	18.8	18.5	17.8	17.4	17.3	16.8
	Hispanic	8.4	8.2	8.3	8.3	8.1	8.3
	Multi-race	4.9	4.6	4.6	4.2	4.2	3.7
	NH/PI	0.1	0.1	0.1	0.1	0.1	0.1
	White	63.8	64.6	65.3	66.0	66.3	67.0
Sex	Female	49.0	49.1	49.0	49.0	49.3	49.2
	Male	51.0	50.9	51.0	51.0	50.7	50.8
Performance Level	<i>Not Proficient</i>	30.4	33.4	32.3	31.7	29.7	22.4
	<i>Partially Proficient</i>	24.5	20.8	21.5	26.6	27.6	15.7
	<i>Proficient</i>	22.4	21.6	28.5	28.2	30.2	22.0
	<i>Advanced</i>	22.7	24.3	17.7	13.5	12.5	39.9
Mathematics							
Total N		101,019	102,602	105,272	109,108	109,072	107,591
Race*	AI/AN	0.5	0.6	0.6	0.7	0.6	0.7
	Asian	3.6	3.5	3.4	3.4	3.4	3.5
	Black	18.8	18.5	17.8	17.4	17.3	16.8
	Hispanic	8.4	8.2	8.4	8.4	8.1	8.3
	Multi-race	4.8	4.6	4.6	4.2	4.2	3.7
	NH/PI	0.1	0.1	0.1	0.1	0.1	0.1
	White	63.8	64.5	65.2	65.9	66.3	67.0
Sex	Female	49.0	49.0	49.0	49.0	49.3	49.2
	Male	51.0	51.0	51.0	51.0	50.7	50.8
Performance Level	<i>Not Proficient</i>	27.5	24.7	36.5	34.3	35.9	27.0
	<i>Partially Proficient</i>	25.8	33.5	28.7	30.6	28.3	31.6
	<i>Proficient</i>	27.2	25.2	18.0	19.0	19.3	26.4
	<i>Advanced</i>	19.5	16.6	16.9	16.2	16.4	15.0

*AI/AN = American Indian/Alaskan Native. NH/PI = Native Hawaiian/Other Pacific Islander.

Table 3.3. Linking Study Sample Demographics (Weighted)

Linking Study Sample (Weighted)							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
ELA/Reading							
Total N		7,503	7,636	7,652	8,030	6,860	5,733
Race*	AI/AN	0.5	0.6	0.6	0.7	0.6	0.7
	Asian	3.5	3.4	3.4	3.3	3.4	3.5
	Black	18.8	18.5	17.8	17.4	17.3	16.8
	Hispanic	8.4	8.2	8.3	8.3	8.1	8.3
	Multi-race	4.9	4.6	4.6	4.2	4.2	3.7
	NH/PI	0.1	0.1	0.1	0.1	0.1	0.1
	White	63.8	64.6	65.3	66.0	66.3	67.0
Sex	Female	49.0	49.1	49.0	49.0	49.3	49.2
	Male	51.0	50.9	51.0	51.0	50.7	50.8
Performance Level	<i>Not Proficient</i>	30.4	33.4	32.3	31.7	29.7	22.4
	<i>Partially Proficient</i>	24.5	20.8	21.5	26.6	27.6	15.7
	<i>Proficient</i>	22.4	21.5	28.5	28.2	30.2	22.0
	<i>Advanced</i>	22.7	24.3	17.7	13.5	12.5	39.9
Mathematics							
Total N		7,529	7,702	7,633	8,056	6,903	5,483
Race*	AI/AN	0.5	0.6	0.6	0.7	0.6	0.7
	Asian	3.6	3.5	3.4	3.4	3.4	3.5
	Black	18.8	18.5	17.8	17.4	17.3	16.8
	Hispanic	8.4	8.2	8.4	8.4	8.1	8.3
	Multi-race	4.8	4.6	4.6	4.2	4.2	3.7
	NH/PI	0.1	0.1	0.1	0.1	0.1	0.1
	White	63.8	64.5	65.2	65.9	66.3	67.0
Sex	Female	49.0	49.0	49.0	49.0	49.3	49.2
	Male	51.0	51.0	51.0	51.0	50.7	50.8
Performance Level	<i>Not Proficient</i>	27.5	24.7	36.5	34.3	35.9	27.0
	<i>Partially Proficient</i>	25.8	33.5	28.7	30.6	28.3	31.6
	<i>Proficient</i>	27.2	25.2	18.0	19.0	19.3	26.4
	<i>Advanced</i>	19.5	16.6	16.8	16.2	16.4	15.0

*AI/AN = American Indian/Alaskan Native. NH/PI = Native Hawaiian/Pacific Islander.

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and Michigan state test scores from Spring 2019, including the correlation coefficient (r) between them. The correlation coefficients between the scores range from 0.77 to 0.84 for ELA/reading and 0.86 to 0.92 for mathematics. Overall, these values indicate a strong relationship among the scores, which is important validity evidence for the claim that MAP Growth scores are good predictors of performance on Michigan’s state assessments. The value for Grade 8 in ELA/reading is lower than average. This is likely due to the construct differences measured by the PSAT ELA assessment (reading and writing) and MAP Growth Reading.

Table 3.4. Descriptive Statistics of Test Scores

Grade	N	<i>r</i>	Michigan State Tests*				MAP Growth*			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	7,503	0.83	1295.3	25.9	1218	1357	198.4	15.0	148	237
4	7,636	0.84	1395.6	25.9	1317	1454	205.4	14.4	148	250
5	7,652	0.83	1496.1	27.0	1409	1560	210.6	14.4	151	251
6	8,030	0.83	1592.9	26.1	1508	1655	215.4	14.1	161	260
7	6,860	0.83	1693.9	26.2	1618	1753	218.4	14.6	159	265
8	5,733	0.77	423.4	82.8	120	710	220.4	15.3	160	267
Mathematics										
3	7,529	0.87	1296.8	27.1	1217	1361	201.6	13.7	141	255
4	7,702	0.88	1393.8	24.9	1310	1455	211.1	14.6	139	269
5	7,633	0.89	1487.7	26.0	1409	1550	218.7	16.8	148	288
6	8,056	0.92	1588.0	25.4	1518	1650	221.0	16.7	147	291
7	6,903	0.91	1688.4	25.9	1621	1752	225.9	17.5	159	294
8	5,483	0.86	415.8	85.6	120	720	229.2	18.8	144	291

*SD = standard deviation. Min. = minimum. Max. = maximum.

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the Michigan state assessment scale score ranges and the corresponding MAP Growth RIT cut scores and percentile ranges by content area and grade. These tables can be used to predict a student's likely performance level on Michigan's state assessment in the spring when MAP Growth is taken in the fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading RIT score of 193 in the fall is likely to reach *Proficient* on the M-STEP ELA test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 203 in the spring is also likely to reach *Proficient* on the M-STEP assessment. The spring cut score is higher than the fall cut score because growth is expected between fall and spring as students receive more instruction during the school year.

Within this report, the cut scores for fall and winter are derived from the spring cuts and the typical growth scores from fall-to-spring or winter-to-spring. The typical growth scores are based on the default instructional weeks most encountered for each term (Weeks 4, 20, and 32 for fall, winter, and spring, respectively). Since instructional weeks often vary by district, the cut scores in this report may differ slightly from the MAP Growth score reports that reflect instructional weeks set by partners. If the actual instructional weeks deviate from the default ones, a student's projected performance level could be different from the generic projection presented in this document. Partners are therefore encouraged to use the projected performance level in students' profile, classroom, and grade reports in the NWEA reporting system since they reflect the specific instructional weeks set by partners.

Table 3.5. MAP Growth Cut Scores—ELA/Reading

Michigan ELA State Test								
Grade	Not Proficient		Partially Proficient		Proficient		Advanced	
3	1203–1279		1280–1299		1300–1316		1317–1357	
4	1301–1382		1383–1399		1400–1416		1417–1454	
5	1409–1480		1481–1499		1500–1523		1524–1560	
6	1508–1577		1578–1599		1600–1623		1624–1655	
7	1618–1678		1679–1699		1700–1725		1726–1753	
8	120–359		360–389		390–439		440–720	
MAP Growth Reading*								
Grade	Not Proficient		Partially Proficient		Proficient		Advanced	
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile
Fall								
2	100–163	1–28	164–180	29–71	181–190	72–88	191–350	89–99
3	100–178	1–31	179–192	32–64	193–202	65–83	203–350	84–99
4	100–190	1–36	191–200	37–59	201–210	60–79	211–350	80–99
5	100–197	1–34	198–207	35–58	208–218	59–80	219–350	81–99
6	100–202	1–32	203–214	33–61	215–226	62–84	227–350	85–99
7	100–206	1–32	207–218	33–60	219–231	61–85	232–350	86–99
8	100–207	1–27	208–220	28–56	221–232	57–80	233–350	81–99
Winter								
2	100–172	1–28	173–188	29–69	189–197	70–86	198–350	87–99
3	100–186	1–32	187–199	33–64	200–207	65–80	208–350	81–99
4	100–196	1–36	197–206	37–60	207–214	61–77	215–350	78–99
5	100–202	1–34	203–211	35–56	212–222	57–80	223–350	81–99
6	100–206	1–32	207–218	33–62	219–228	63–82	229–350	83–99
7	100–209	1–32	210–221	33–61	222–232	62–83	233–350	84–99
8	100–210	1–27	211–222	28–55	223–233	56–78	234–350	79–99
Spring								
2	100–177	1–30	178–192	31–67	193–201	68–85	202–350	86–99
3	100–190	1–34	191–202	35–63	203–210	64–79	211–350	80–99
4	100–199	1–37	200–208	38–59	209–216	60–76	217–350	77–99
5	100–204	1–34	205–213	35–56	214–223	57–78	224–350	79–99
6	100–208	1–34	209–219	35–60	220–229	61–81	230–350	82–99
7	100–211	1–34	212–222	35–60	223–233	61–82	234–350	83–99
8	100–212	1–29	213–223	30–55	224–234	56–78	235–350	79–99

*Cut scores for fall and winter are derived from the spring cuts and growth norms based on the typical instructional weeks. Spring cut scores for Grade 2 were derived from the Grade 3 cuts using the growth norms. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes.

Table 3.6. MAP Growth Cut Scores—Mathematics

Michigan Mathematics State Test								
Grade	Not Proficient		Partially Proficient		Proficient		Advanced	
3	1217–1280		1281–1299		1300–1320		1321–1361	
4	1310–1375		1376–1399		1400–1419		1420–1455	
5	1409–1477		1478–1499		1500–1514		1515–1550	
6	1518–1578		1579–1599		1600–1613		1614–1650	
7	1621–1678		1679–1699		1700–1715		1716–1752	
8	120–369		370–429		430–509		510–720	
MAP Growth Mathematics*								
Grade	Not Proficient		Partially Proficient		Proficient		Advanced	
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile
Fall								
2	100–167	1–28	168–178	29–61	179–188	62–85	189–350	86–99
3	100–181	1–31	182–191	32–59	192–200	60–81	201–350	82–99
4	100–189	1–24	190–203	25–61	204–214	62–85	215–350	86–99
5	100–202	1–33	203–216	34–69	217–225	70–86	226–350	87–99
6	100–206	1–31	207–220	32–64	221–229	65–82	230–350	83–99
7	100–213	1–35	214–225	36–62	226–236	63–82	237–350	83–99
8	100–214	1–29	215–228	30–58	229–244	59–85	245–350	86–99
Winter								
2	100–176	1–28	177–187	29–61	188–196	62–83	197–350	84–99
3	100–189	1–31	190–198	32–57	199–207	58–80	208–350	81–99
4	100–196	1–26	197–210	27–62	211–221	63–85	222–350	86–99
5	100–208	1–35	209–222	36–69	223–231	70–85	232–350	86–99
6	100–211	1–32	212–225	33–64	226–234	65–81	235–350	82–99
7	100–216	1–34	217–229	35–62	230–240	63–82	241–350	83–99
8	100–218	1–31	219–231	32–57	232–247	58–84	248–350	85–99
Spring								
2	100–182	1–31	183–192	32–60	193–201	61–82	202–350	83–99
3	100–194	1–32	195–203	33–57	204–212	58–79	213–350	80–99
4	100–200	1–26	201–214	27–60	215–225	61–83	226–350	84–99
5	100–212	1–36	213–226	37–68	227–235	69–84	236–350	85–99
6	100–214	1–32	215–228	33–63	229–237	64–80	238–350	81–99
7	100–219	1–35	220–232	36–62	233–243	63–81	244–350	82–99
8	100–220	1–31	221–233	32–56	234–249	57–83	250–350	84–99

*Cut scores for fall and winter are derived from the spring cuts and growth norms based on the typical instructional weeks. Spring cut scores for Grade 2 were derived from the Grade 3 cuts using the growth norms. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes.

3.4. Read by Grade 3 (RBG3) Program

Michigan’s Read by Grade 3 (RBG3) law requires that students who are more than one grade level behind in reading be subject to retention and additional support to improve their reading level. The Michigan Department of Education (MDE) worked with educators and technical experts to establish a unique cut score for the M-STEP Grade 3 ELA assessment to measure reading as outlined by the RBG3 law. Students with a score of 1253 or higher are not subject to the retention policy (Keesler, 2019). To support the retention policy as an alternative assessment, NWEA has identified the spring MAP Growth Reading cut score for Grade 3 that corresponds to the retention cut score of 1253 on the M-STEP Grade 3 ELA test, as shown in Table 3.7. With this information, educators can identify students who are not subject to retention based on their spring MAP Growth RIT scores. For example, a Grade 3 student with a MAP Growth Reading score of 171 or higher in the spring is likely to get a score 1253 or higher on the M-STEP ELA test and would therefore not be subject to retention.

Additional information includes the corresponding MAP Growth percentile, the correlation (r) of the two tests, and the classification accuracy rate. The MAP Growth percentile rank for score 171 is 5. The correlation between the MAP Growth and M-STEP test scores is 0.83, which indicates a strong relationship between the scores. The classification accuracy rate of 0.94 indicates that 94% of students are correctly classified by their MAP Growth Reading score as being subject to retention or not.

Table 3.7. RBG3 Cut Scores and Classification Accuracy

N	r	M-STEP Cut	MAP Growth Cut	MAP Growth Percentile	Classification Accuracy Rate
7,503	0.83	1253	171	5	0.94

3.5. Classification Accuracy

Table 3.8 presents the classification accuracy summary statistics, including the overall classification accuracy rate. These results indicate how well MAP Growth spring RIT scores predict proficiency on Michigan’s state assessments, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.77 to 0.85 for ELA/reading and 0.79 to 0.90 for mathematics. Overall, these values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the Michigan state assessment. For Grade 2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students’ proficiency status on the M-STEP in Grade 3. The value for Grade 8 in ELA/reading is lower than average. This is likely due to the construct differences measured by the PSAT ELA assessment (reading and writing) and MAP Growth Reading. The Grade 2 classification accuracy rate refers to how well the MAP Growth cuts can predict students’ proficiency status on the state test in Grade 3. Consequently, the further back from Grade 3 the cut scores were extrapolated, the lower the expected classification accuracy rate.

Although the results show that MAP Growth scores can be used to accurately classify students as likely to be proficient on the state tests, there is a notable limitation to how these results should be used and interpreted. The Michigan state assessments and MAP Growth are designed for different purposes and measure slightly different constructs even within the same content area. Therefore, scores on the two tests cannot be assumed to be interchangeable. MAP Growth may not be used as a substitute for the state tests and vice versa.

Table 3.8. Classification Accuracy Results

Grade	N	Cut Score		Class. Accuracy*	Rate*		Sensitivity	Specificity	Precision	AUC*
		MAP Growth	Michigan		FP	FN				
ELA/Reading										
2	5,027	193	1300	0.77	0.11	0.37	0.63	0.89	0.82	0.86
3	7,503	203	1300	0.84	0.12	0.19	0.81	0.88	0.84	0.93
4	7,636	209	1400	0.85	0.13	0.16	0.84	0.87	0.84	0.93
5	7,652	214	1500	0.85	0.15	0.16	0.84	0.85	0.83	0.93
6	8,030	220	1600	0.85	0.12	0.18	0.82	0.88	0.83	0.93
7	6,860	223	1700	0.85	0.12	0.19	0.81	0.88	0.84	0.93
8	5,733	224	390	0.77	0.07	0.33	0.67	0.93	0.94	0.90
Mathematics										
2	4,961	193	1300	0.79	0.24	0.18	0.82	0.76	0.77	0.88
3	7,529	204	1300	0.86	0.15	0.14	0.86	0.85	0.84	0.94
4	7,702	215	1400	0.87	0.12	0.14	0.86	0.88	0.84	0.95
5	7,633	227	1500	0.89	0.08	0.18	0.82	0.92	0.85	0.96
6	8,056	229	1600	0.90	0.07	0.16	0.84	0.93	0.87	0.97
7	6,903	233	1700	0.90	0.08	0.13	0.87	0.92	0.86	0.97
8	5,483	234	430	0.87	0.11	0.17	0.83	0.89	0.85	0.95

*Class. Accuracy = overall classification accuracy rate. FP = false positives. FN = false negatives. AUC = area under the ROC curve.

3.6. Proficiency Projection

Table 3.9 and Table 3.10 present the estimated probability of achieving *Proficient* performance on the Michigan state assessment based on RIT scores from fall, winter, or spring. “Prob.” indicates the probability of obtaining proficient status on the state test in the spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 204 in the fall has an 89% chance of reaching *Proficient* or higher on the M-STEP test.

Table 3.9. Proficiency Projection based on RIT Scores—ELA/Reading

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
2	5	193	147	No	<0.01	156	No	<0.01	160	No	<0.01
	10	193	153	No	<0.01	162	No	<0.01	166	No	<0.01
	15	193	157	No	<0.01	166	No	<0.01	170	No	<0.01
	20	193	160	No	0.01	169	No	<0.01	173	No	<0.01
	25	193	162	No	0.01	171	No	<0.01	175	No	<0.01
	30	193	164	No	0.02	173	No	<0.01	177	No	<0.01
	35	193	166	No	0.04	175	No	0.01	180	No	<0.01
	40	193	168	No	0.07	177	No	0.02	182	No	<0.01
	45	193	170	No	0.09	179	No	0.03	184	No	<0.01
	50	193	172	No	0.15	181	No	0.07	186	No	0.01
	55	193	174	No	0.21	183	No	0.13	188	No	0.06
	60	193	176	No	0.30	185	No	0.23	189	No	0.11
	65	193	178	No	0.40	187	No	0.35	192	No	0.38
	70	193	180	No	0.45	189	Yes	0.50	194	Yes	0.62
	75	193	183	Yes	0.60	191	Yes	0.65	196	Yes	0.83
	80	193	185	Yes	0.70	194	Yes	0.83	199	Yes	0.97
	85	193	188	Yes	0.79	197	Yes	0.93	202	Yes	>0.99
90	193	192	Yes	0.91	200	Yes	0.98	205	Yes	>0.99	
95	193	197	Yes	0.97	206	Yes	>0.99	211	Yes	>0.99	
3	5	203	159	No	<0.01	167	No	<0.01	170	No	<0.01
	10	203	165	No	<0.01	173	No	<0.01	176	No	<0.01
	15	203	169	No	<0.01	177	No	<0.01	180	No	<0.01
	20	203	173	No	0.01	180	No	<0.01	183	No	<0.01
	25	203	175	No	0.02	183	No	<0.01	186	No	<0.01
	30	203	178	No	0.04	185	No	<0.01	189	No	<0.01
	35	203	180	No	0.05	188	No	0.02	191	No	<0.01
	40	203	182	No	0.09	190	No	0.03	193	No	<0.01
	45	203	185	No	0.17	192	No	0.07	195	No	0.01
	50	203	187	No	0.21	194	No	0.13	197	No	0.03
	55	203	189	No	0.30	196	No	0.23	199	No	0.11
	60	203	191	No	0.39	198	No	0.35	201	No	0.27
	65	203	193	Yes	0.50	200	Yes	0.50	203	Yes	0.50
	70	203	195	Yes	0.55	202	Yes	0.65	206	Yes	0.83
	75	203	198	Yes	0.70	205	Yes	0.83	208	Yes	0.94
	80	203	201	Yes	0.83	207	Yes	0.91	211	Yes	0.99
	85	203	204	Yes	0.89	211	Yes	0.97	214	Yes	>0.99
90	203	208	Yes	0.96	215	Yes	>0.99	218	Yes	>0.99	
95	203	214	Yes	0.99	220	Yes	>0.99	224	Yes	>0.99	

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
4	5	209	169	No	<0.01	176	No	<0.01	178	No	<0.01
	10	209	175	No	<0.01	182	No	<0.01	184	No	<0.01
	15	209	179	No	<0.01	186	No	<0.01	188	No	<0.01
	20	209	183	No	0.01	189	No	<0.01	191	No	<0.01
	25	209	185	No	0.03	192	No	<0.01	194	No	<0.01
	30	209	188	No	0.05	194	No	0.01	196	No	<0.01
	35	209	190	No	0.08	196	No	0.03	199	No	<0.01
	40	209	192	No	0.13	198	No	0.06	201	No	0.01
	45	209	195	No	0.20	200	No	0.09	203	No	0.03
	50	209	197	No	0.29	202	No	0.17	205	No	0.11
	55	209	199	No	0.39	205	No	0.35	207	No	0.27
	60	209	201	Yes	0.50	207	Yes	0.50	209	Yes	0.50
	65	209	203	Yes	0.56	209	Yes	0.65	211	Yes	0.73
	70	209	205	Yes	0.66	211	Yes	0.78	213	Yes	0.89
	75	209	208	Yes	0.80	213	Yes	0.87	216	Yes	0.99
	80	209	211	Yes	0.87	216	Yes	0.96	219	Yes	>0.99
	85	209	214	Yes	0.94	219	Yes	0.99	222	Yes	>0.99
90	209	218	Yes	0.97	223	Yes	>0.99	226	Yes	>0.99	
95	209	224	Yes	>0.99	229	Yes	>0.99	232	Yes	>0.99	
5	5	214	178	No	<0.01	183	No	<0.01	185	No	<0.01
	10	214	183	No	<0.01	189	No	<0.01	191	No	<0.01
	15	214	187	No	0.01	193	No	<0.01	194	No	<0.01
	20	214	191	No	0.02	196	No	<0.01	198	No	<0.01
	25	214	193	No	0.04	198	No	<0.01	200	No	<0.01
	30	214	196	No	0.08	201	No	0.02	203	No	<0.01
	35	214	198	No	0.11	203	No	0.04	205	No	<0.01
	40	214	200	No	0.17	205	No	0.09	207	No	0.01
	45	214	202	No	0.24	207	No	0.17	209	No	0.06
	50	214	204	No	0.34	209	No	0.28	211	No	0.17
	55	214	207	No	0.44	211	No	0.42	213	No	0.38
	60	214	209	Yes	0.56	213	Yes	0.58	215	Yes	0.62
	65	214	211	Yes	0.66	215	Yes	0.72	217	Yes	0.83
	70	214	213	Yes	0.71	217	Yes	0.78	219	Yes	0.94
	75	214	216	Yes	0.83	220	Yes	0.91	222	Yes	0.99
	80	214	218	Yes	0.89	222	Yes	0.96	224	Yes	>0.99
	85	214	221	Yes	0.94	226	Yes	0.99	228	Yes	>0.99
90	214	225	Yes	0.98	229	Yes	>0.99	231	Yes	>0.99	
95	214	231	Yes	>0.99	235	Yes	>0.99	237	Yes	>0.99	

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
6	5	220	183	No	<0.01	188	No	<0.01	189	No	<0.01
	10	220	189	No	<0.01	193	No	<0.01	195	No	<0.01
	15	220	193	No	<0.01	197	No	<0.01	199	No	<0.01
	20	220	196	No	0.01	200	No	<0.01	202	No	<0.01
	25	220	199	No	0.02	203	No	<0.01	205	No	<0.01
	30	220	202	No	0.04	205	No	0.01	207	No	<0.01
	35	220	204	No	0.08	208	No	0.03	209	No	<0.01
	40	220	206	No	0.13	210	No	0.06	211	No	<0.01
	45	220	208	No	0.16	212	No	0.12	213	No	0.01
	50	220	210	No	0.24	214	No	0.22	215	No	0.06
	55	220	212	No	0.33	216	No	0.28	217	No	0.17
	60	220	214	No	0.44	218	No	0.42	219	No	0.38
	65	220	217	Yes	0.56	220	Yes	0.58	222	Yes	0.73
	70	220	219	Yes	0.67	222	Yes	0.72	224	Yes	0.89
	75	220	221	Yes	0.76	225	Yes	0.88	226	Yes	0.97
	80	220	224	Yes	0.84	227	Yes	0.94	229	Yes	>0.99
	85	220	227	Yes	0.92	230	Yes	0.98	232	Yes	>0.99
90	220	231	Yes	0.98	234	Yes	>0.99	236	Yes	>0.99	
95	220	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99	
7	5	223	187	No	<0.01	190	No	<0.01	191	No	<0.01
	10	223	193	No	<0.01	196	No	<0.01	197	No	<0.01
	15	223	197	No	<0.01	200	No	<0.01	201	No	<0.01
	20	223	200	No	0.01	203	No	<0.01	205	No	<0.01
	25	223	203	No	0.02	206	No	<0.01	207	No	<0.01
	30	223	206	No	0.04	209	No	0.01	210	No	<0.01
	35	223	208	No	0.08	211	No	0.03	212	No	<0.01
	40	223	210	No	0.12	213	No	0.04	214	No	<0.01
	45	223	212	No	0.16	215	No	0.09	216	No	0.01
	50	223	214	No	0.24	217	No	0.17	218	No	0.06
	55	223	216	No	0.33	219	No	0.28	220	No	0.17
	60	223	218	No	0.44	221	No	0.42	223	Yes	0.50
	65	223	221	Yes	0.56	223	Yes	0.58	225	Yes	0.73
	70	223	223	Yes	0.67	226	Yes	0.78	227	Yes	0.89
	75	223	225	Yes	0.76	228	Yes	0.88	229	Yes	0.97
	80	223	228	Yes	0.88	231	Yes	0.96	232	Yes	>0.99
	85	223	231	Yes	0.92	234	Yes	0.99	235	Yes	>0.99
90	223	235	Yes	0.98	238	Yes	>0.99	239	Yes	>0.99	
95	223	241	Yes	>0.99	244	Yes	>0.99	245	Yes	>0.99	

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
8	5	224	190	No	<0.01	193	No	<0.01	194	No	<0.01
	10	224	196	No	<0.01	199	No	<0.01	200	No	<0.01
	15	224	200	No	0.01	203	No	<0.01	204	No	<0.01
	20	224	204	No	0.02	206	No	<0.01	207	No	<0.01
	25	224	207	No	0.05	209	No	0.01	210	No	<0.01
	30	224	209	No	0.08	212	No	0.02	213	No	<0.01
	35	224	211	No	0.11	214	No	0.04	215	No	<0.01
	40	224	214	No	0.20	216	No	0.09	217	No	0.01
	45	224	216	No	0.29	218	No	0.17	220	No	0.11
	50	224	218	No	0.39	221	No	0.35	222	No	0.27
	55	224	220	No	0.45	223	Yes	0.50	224	Yes	0.50
	60	224	222	Yes	0.55	225	Yes	0.65	226	Yes	0.73
	65	224	225	Yes	0.71	227	Yes	0.78	228	Yes	0.89
	70	224	227	Yes	0.80	229	Yes	0.87	231	Yes	0.99
	75	224	230	Yes	0.87	232	Yes	0.96	233	Yes	>0.99
	80	224	232	Yes	0.92	235	Yes	0.99	236	Yes	>0.99
	85	224	236	Yes	0.97	238	Yes	>0.99	239	Yes	>0.99
90	224	240	Yes	0.99	242	Yes	>0.99	243	Yes	>0.99	
95	224	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99	

Table 3.10. Proficiency Projection based on RIT Scores—Mathematics

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
2	5	193	154	No	<0.01	163	No	<0.01	167	No	<0.01
	10	193	158	No	<0.01	167	No	<0.01	172	No	<0.01
	15	193	162	No	0.01	171	No	<0.01	175	No	<0.01
	20	193	164	No	0.01	173	No	<0.01	178	No	<0.01
	25	193	166	No	0.03	175	No	0.01	180	No	<0.01
	30	193	168	No	0.06	177	No	0.02	182	No	<0.01
	35	193	170	No	0.11	179	No	0.05	184	No	<0.01
	40	193	172	No	0.18	181	No	0.07	186	No	0.01
	45	193	173	No	0.22	182	No	0.10	188	No	0.04
	50	193	175	No	0.27	184	No	0.20	189	No	0.08
	55	193	177	No	0.38	186	No	0.34	191	No	0.25
	60	193	178	No	0.44	187	No	0.42	193	Yes	0.50
	65	193	180	Yes	0.56	189	Yes	0.58	195	Yes	0.75
	70	193	182	Yes	0.68	191	Yes	0.74	196	Yes	0.85
	75	193	184	Yes	0.78	193	Yes	0.85	198	Yes	0.96
	80	193	186	Yes	0.82	195	Yes	0.93	201	Yes	>0.99
	85	193	188	Yes	0.89	198	Yes	0.98	203	Yes	>0.99
90	193	192	Yes	0.97	201	Yes	>0.99	207	Yes	>0.99	
95	193	196	Yes	0.99	205	Yes	>0.99	212	Yes	>0.99	
3	5	204	166	No	<0.01	174	No	<0.01	178	No	<0.01
	10	204	171	No	<0.01	179	No	<0.01	183	No	<0.01
	15	204	175	No	<0.01	182	No	<0.01	186	No	<0.01
	20	204	177	No	0.01	185	No	<0.01	189	No	<0.01
	25	204	179	No	0.03	187	No	0.01	192	No	<0.01
	30	204	181	No	0.05	189	No	0.02	194	No	<0.01
	35	204	183	No	0.10	191	No	0.04	196	No	<0.01
	40	204	185	No	0.17	193	No	0.10	198	No	0.02
	45	204	187	No	0.26	195	No	0.20	199	No	0.04
	50	204	188	No	0.31	196	No	0.26	201	No	0.15
	55	204	190	No	0.44	198	No	0.42	203	No	0.37
	60	204	192	Yes	0.50	200	Yes	0.58	205	Yes	0.63
	65	204	194	Yes	0.63	201	Yes	0.67	207	Yes	0.85
	70	204	196	Yes	0.74	203	Yes	0.80	208	Yes	0.92
	75	204	198	Yes	0.83	205	Yes	0.90	211	Yes	0.99
	80	204	200	Yes	0.90	208	Yes	0.97	213	Yes	>0.99
	85	204	202	Yes	0.95	210	Yes	0.99	216	Yes	>0.99
90	204	206	Yes	0.99	214	Yes	>0.99	219	Yes	>0.99	
95	204	211	Yes	>0.99	219	Yes	>0.99	224	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
4	5	215	176	No	<0.01	182	No	<0.01	185	No	<0.01
	10	215	181	No	<0.01	187	No	<0.01	191	No	<0.01
	15	215	185	No	<0.01	191	No	<0.01	194	No	<0.01
	20	215	187	No	<0.01	194	No	<0.01	197	No	<0.01
	25	215	190	No	0.01	196	No	<0.01	200	No	<0.01
	30	215	192	No	0.03	198	No	<0.01	202	No	<0.01
	35	215	194	No	0.05	200	No	0.01	205	No	<0.01
	40	215	196	No	0.10	202	No	0.03	207	No	<0.01
	45	215	198	No	0.17	204	No	0.07	209	No	0.02
	50	215	200	No	0.26	206	No	0.14	211	No	0.08
	55	215	201	No	0.32	208	No	0.26	212	No	0.15
	60	215	203	No	0.44	210	No	0.42	214	No	0.37
	65	215	205	Yes	0.56	212	Yes	0.58	217	Yes	0.75
	70	215	207	Yes	0.68	214	Yes	0.74	219	Yes	0.92
	75	215	209	Yes	0.79	216	Yes	0.86	221	Yes	0.98
	80	215	212	Yes	0.90	219	Yes	0.96	224	Yes	>0.99
85	215	214	Yes	0.95	221	Yes	0.98	227	Yes	>0.99	
90	215	218	Yes	0.99	225	Yes	>0.99	230	Yes	>0.99	
95	215	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99	
5	5	227	184	No	<0.01	189	No	<0.01	191	No	<0.01
	10	227	190	No	<0.01	194	No	<0.01	197	No	<0.01
	15	227	193	No	<0.01	198	No	<0.01	201	No	<0.01
	20	227	196	No	<0.01	201	No	<0.01	205	No	<0.01
	25	227	199	No	<0.01	204	No	<0.01	207	No	<0.01
	30	227	201	No	0.01	206	No	<0.01	210	No	<0.01
	35	227	203	No	0.02	209	No	<0.01	212	No	<0.01
	40	227	205	No	0.03	211	No	0.01	215	No	<0.01
	45	227	207	No	0.06	213	No	0.02	217	No	<0.01
	50	227	209	No	0.11	215	No	0.05	219	No	<0.01
	55	227	211	No	0.18	217	No	0.10	221	No	0.02
	60	227	213	No	0.27	219	No	0.20	223	No	0.08
	65	227	215	No	0.38	221	No	0.34	225	No	0.25
	70	227	217	Yes	0.50	223	Yes	0.50	228	Yes	0.63
	75	227	219	Yes	0.62	225	Yes	0.66	230	Yes	0.85
	80	227	222	Yes	0.78	228	Yes	0.85	233	Yes	0.98
85	227	225	Yes	0.89	231	Yes	0.95	236	Yes	>0.99	
90	227	229	Yes	0.97	235	Yes	0.99	240	Yes	>0.99	
95	227	234	Yes	>0.99	241	Yes	>0.99	246	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
6	5	229	188	No	<0.01	192	No	<0.01	194	No	<0.01
	10	229	194	No	<0.01	198	No	<0.01	200	No	<0.01
	15	229	198	No	<0.01	202	No	<0.01	205	No	<0.01
	20	229	201	No	<0.01	205	No	<0.01	208	No	<0.01
	25	229	204	No	<0.01	208	No	<0.01	211	No	<0.01
	30	229	206	No	0.01	211	No	<0.01	214	No	<0.01
	35	229	209	No	0.03	213	No	<0.01	216	No	<0.01
	40	229	211	No	0.06	215	No	0.01	218	No	<0.01
	45	229	213	No	0.10	217	No	0.03	221	No	<0.01
	50	229	215	No	0.17	220	No	0.10	223	No	0.02
	55	229	217	No	0.27	222	No	0.20	225	No	0.08
	60	229	219	No	0.38	224	No	0.34	227	No	0.25
	65	229	221	Yes	0.50	226	Yes	0.50	230	Yes	0.63
	70	229	223	Yes	0.62	228	Yes	0.66	232	Yes	0.85
	75	229	226	Yes	0.78	231	Yes	0.86	235	Yes	0.98
	80	229	228	Yes	0.86	234	Yes	0.96	238	Yes	>0.99
	85	229	231	Yes	0.94	237	Yes	0.99	241	Yes	>0.99
90	229	235	Yes	0.99	241	Yes	>0.99	245	Yes	>0.99	
95	229	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99	
7	5	233	192	No	<0.01	194	No	<0.01	196	No	<0.01
	10	233	198	No	<0.01	201	No	<0.01	203	No	<0.01
	15	233	202	No	<0.01	205	No	<0.01	207	No	<0.01
	20	233	206	No	<0.01	209	No	<0.01	211	No	<0.01
	25	233	208	No	<0.01	212	No	<0.01	214	No	<0.01
	30	233	211	No	<0.01	215	No	<0.01	217	No	<0.01
	35	233	213	No	0.01	217	No	<0.01	220	No	<0.01
	40	233	216	No	0.04	219	No	0.01	222	No	<0.01
	45	233	218	No	0.10	222	No	0.04	224	No	<0.01
	50	233	220	No	0.17	224	No	0.10	227	No	0.02
	55	233	222	No	0.26	226	No	0.20	229	No	0.08
	60	233	225	No	0.44	229	No	0.42	231	No	0.25
	65	233	227	Yes	0.56	231	Yes	0.58	234	Yes	0.63
	70	233	229	Yes	0.69	233	Yes	0.74	236	Yes	0.85
	75	233	232	Yes	0.83	236	Yes	0.90	239	Yes	0.98
	80	233	235	Yes	0.93	239	Yes	0.97	242	Yes	>0.99
	85	233	238	Yes	0.97	243	Yes	>0.99	246	Yes	>0.99
90	233	243	Yes	>0.99	247	Yes	>0.99	251	Yes	>0.99	
95	233	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
8	5	234	194	No	<0.01	196	No	<0.01	197	No	<0.01
	10	234	201	No	<0.01	203	No	<0.01	205	No	<0.01
	15	234	205	No	<0.01	208	No	<0.01	210	No	<0.01
	20	234	209	No	<0.01	212	No	<0.01	214	No	<0.01
	25	234	212	No	0.01	215	No	<0.01	217	No	<0.01
	30	234	215	No	0.03	218	No	<0.01	220	No	<0.01
	35	234	218	No	0.06	221	No	0.01	223	No	<0.01
	40	234	220	No	0.10	223	No	0.03	225	No	<0.01
	45	234	223	No	0.19	226	No	0.11	228	No	0.02
	50	234	225	No	0.28	228	No	0.20	230	No	0.08
	55	234	227	No	0.39	231	No	0.42	233	No	0.37
	60	234	230	Yes	0.56	233	Yes	0.58	235	Yes	0.63
	65	234	232	Yes	0.67	236	Yes	0.80	238	Yes	0.92
	70	234	235	Yes	0.81	238	Yes	0.89	241	Yes	0.99
	75	234	238	Yes	0.90	241	Yes	0.97	244	Yes	>0.99
	80	234	241	Yes	0.96	244	Yes	0.99	247	Yes	>0.99
	85	234	245	Yes	0.99	248	Yes	>0.99	251	Yes	>0.99
90	234	249	Yes	>0.99	253	Yes	>0.99	256	Yes	>0.99	
95	234	256	Yes	>0.99	260	Yes	>0.99	263	Yes	>0.99	

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